FORT MICHILIMACKINAC ARCHEOLOGICAL INVESTIGATIONS 1974 AND 1975

ARCHEOLOGICAL COMPLETION REPORT SERIES, NUMBER 7

FORT MICHILIMACKINAC ARCHEOLOGICAL INVESTIGATIONS 1974 AND 1975

Donald P. Heldman and William L. Minnerly

Prepared for distribution by the
Branch of State Projects
National Park Service

Archeological Completion Report Series, Number 7
Technical Preservation Services Division
Office of Archeology and Historic Preservation
National Park Service
Department of the Interior
Washington, D.C.
1976

EXCAVATIONS AT FORT MICHILIMACKINAC, 1974 SEASON:

A PRELIMINARY REPORT ON HISTORICAL PRESERVATION GRANT NUMBER 26-74-00092

by

William L. Minnerly

COMPLETION REPORT

a. Excavation of the Fort Michilimackinac Powder Magazine
Grant Number 26-74-00092

b. Total project - $10,000
Federal share - 5,000

c. Federal funds expended - $5,000

d. Dr. Donald P. Heldman

e. Work accomplished: A portion of the Fort Michilimackinac, 1715-1781, Powder Magazine was excavated. The findings confirmed the structure indicated on four historic maps. After additional excavation, sufficient information may be available to make possible an authentic reconstruction. For further details, see enclosed report.

f. For maps and photographs, see enclosed report.

g. The Powder Magazine is a part of Fort Michilimackinac National Historic Landmark. This site has been under archaeological and historical investigation since 1959. Under the administration of the Mackinac Island State Park Commission the palisade and seven buildings within the fort have been reconstructed. An active interpretive program interprets the site to approximately 200,000 visitors each year. Admission fees from these visitors are used to reconstruct and maintain the historic properties.

March 20, 1975

TABLE OF CONTENTS

Introduction

During the summer of 1974 the Mackinac Island State Park Commission in cooperation with the Museum, Michigan State University, initiated Historical Preservation Grant number 26-74-00092 awarded by the National Park Service, and administered by the Michigan History Division, Michigan Department of State. This project is designed to archaeologically locate and uncover the powder magazine at Fort Michilimackinac, a French colonial settlement founded early in the 18th century and occupied continuously by the French until 1761. As a result of the French and Indian War, Michilimackinac was given by treaty to Great Britain, whose army occupied and rebuilt it for a short period thereafter. Because continuing restoration of the site is based upon both archaeological field work and historical research, it was hoped that the powder magazine could be located.

Between June 21 and August 31, 1974, five full-time and two part-time workers comprised the field crew at Michilimackinac. They were participants in the sixteenth annual archaeological field season to be co-sponsored by the two cooperating institutions. Additional field help was forthcoming from members of the Michigan Archaeological Society, who participated in an on-the-site amateur program. The 1974 field season was the first since 1969 to devote an entire summer's work exclusively to an area within the fort. Field work was confined to the southeast bastion area, the first systematic excavation ever held within the eastern half of Michilimackinac, in a successful attempt to find the powder magazine.

Documentary Information

Prior to the 1974 field season, historic documentation concerning the powder magazine of Michilimackinac consisted of only six references in the Thomas Gage Papers and Michigan Pioneer and Historical Collections (Maxwell and Binford 1961 : 14-18). Three maps of Michilimackinac made by the British

during their occupation of the site give approximate locations and dimensions of buildings, both on the interior as well as the outside of the fort (Figures 2, 3, and 4). None of the plans agree with each other absolutely, however. Four references in the Gage Papers make mention of deterioration of the magazine and its subsequent repair. All four date between 1765 and 1772, and all suggest that the powder magazine was a wood frame superstructure built over a basement. That the magazine actually was of wood is supported by additional documentary evidence in the recently discovered Lotbinière journal of 1749 and, as will be seen later, by the archaeological field work of 1974.

Several letters make mention of the dismantling of a house adjacent to the powder magazine and have led several investigators to conclude that the magazine was "razed" for its timber and cut stone in 1781. At that time the fort was reestablished on nearby Mackinac Island (Maxwell n.d.: 13; Maxwell and Binford 1961 : 15-16). The reference to "razing" is an unfortunate misreading of a letter from Sinclair to Gage, dated May 12, 1781, (Bartholomew 1908 : 495). Actually "raise" refers to the construction of a new magazine on Mackinac Island and not to the dismantling or "razing" of the powder magazine at Michilimackinac.

As mentioned earlier, all three fort plans of Michilimackinac done by the British post-date French occupation of Fort Michilimackinac. Each shows the powder magazine near the southeast bastion, but only the Crown Collection (1765) and Magra (1766) maps depict an actual building (Figures 2 and 3). Maxwell's suggestion that the difference in the sizes of the magazine as depicted on the Magra and Nordberg (1769) plans reflects a later enlargement of the building (1961 : 14) failed to take into account the absence of a magazine on the Nordberg plan. Only a lot line is represented on the Nordberg plan (Figure 4).

Structural detail of the powder magazine at Michilimackinac though far

from complete, is partially known. The illustration of the powder magazine on the Crown Map conveys striking structural detail. This is in contrast to other buildings on the Crown or, for that matter, the other British plans of Michilimackinac. Nevertheless, what can be construed as a double-door entrance, an entranceway, and a low vaulted (barrel ?) roof above are particularly important (Figure 2). The entranceway apparently leads to a basement.

While excavations were going on at Michilimackinac, a hitherto unknown French colonial plan of the site was discovered in the Public Archives of Canada, Ottawa, and was forwarded to the Mackinac Island State Park Commission. Drawn by Lotbinière in c. 1749, the French plan shows the powder magazine where the later British maps placed it (Figure 1). A journal written by Lotbinière accompanies the plan and describes, among other things, a magazine "buried and covered with turf." It further states that the powder magazine in its construction cut through an older palisade line and street within the southeast corner of the fort (Gérin-Lajoie 1974 : 7). Moreover, the palisade appears on the French plan. Quite probably the palisade corresponds to that called an "early unordered" sequence of stockade expansion by Brown (n.d.: 3-17). In any case, the palisade illustrated on the French plan is in agreement with both the graphic detail on the Crown map and written references to structural damage to walls of the magazine, the latter apparently due to water seepage. Also, a hitherto unquoted reference to the powder magazine in the Gage Papers was noted by the author. It appears in a letter from Turnbull to Gage, dated September 23, 1771, and concerns the need for repairs on "pickets and beams" for the storehouse and magazine.

To sum up then, the location of a powder magazine in the southeast corner of Michilimackinac, long suspected because of a visible depression there, seemed probable after the review of historic documents.

Field Procedures

The 1974 field season at Michilimackinac sought to locate, outline, and interpret whatever survived of the powder magazine. Work began in a large circular depression in the southeast corner of the present stockade, a configuration long thought to be the ruined powder magazine. The presence of the large depression permitted the field crew to work within a highly specific area of the fort, one result of which was a concentrated effort in a very limited space. This is in contrast to normal field procedures which, more often than not, involve a larger area of excavation and less concentrated work force. In the case of 1974, care in the outlining of the overlying fill, both vertical and horizontal, resulted in the precise location of the powder magazine, the discovery of an entranceway, and the recording of its dimensions.

Excavation procedures and controls employed in the excavation of the magazine continued those used by earlier investigators at Michilimackinac. Whenever possible, features were followed as units in and of themselves. Otherwise, arbitrary controls were used. In the latter case, levels and the contents within them were kept scrupulously within the 10 feet grid system established initially in 1959, and followed ever since. Features were numbered consecutively. The magazine itself was not assigned a feature number. Each level was determined by an absolute elevation taken from one of three semi-permanent elevation markers which served as datums. All materials were sifted through quarter-inch or one-eighth of an inch wire mesh screens, except in those instances where finer screening was necessary, specifically those of feature excavations. In the latter case, dirt was forced through window screen with water from a hose. Isolated lenses of sterile soils within the overlying fill were sometimes removed without sifting.

One significant departure from excavation procedures practiced at Michilimackinac is that which off-set the grid system five feet within the

powder magazine excavation. Because dimensions of the magazine as inferred from the British plans indicated that walls would parallel the bisecting lines of the grid system, it was decided to off-set excavation units by five feet, and thereby eliminate the possibility of balks resting co-terminously above the walls of the magazine. This alteration in the pattern of excavation for the most part proved successful. Specifically, the grid base was moved five feet to the south of base lines 270, 280 and 290; units excavated include 275R100, 275R110, 275R120, 275R130, 285R100, 285R110, 285R120, 285R130, 285R140, 295R120, and 295R130.

Because of the physical characteristics of the fill over much of the powder magazine, an extensive system of balks was maintained throughout the summer season in order to preserve a stratigraphic record of the excavation. Two balks were retained in an east-west line along the 275 and 285 base lines. An additional balk was retained perpendicular to the base lines along the R130 axis. Balks converged within the area determined to be the magazine interior, and thus provided four vertical profiles of deposits resting upon the magazine floor. A total of 90 linear feet comprised the length of the balk system. The width of the balks averaged 15 inches upon the surface, but increased as depths increased. To expose a portion of the original floor of the magazine, an 8 foot section of the R130 balk was removed between stakes 275R130 and 285R130.

Stratigraphy

Stratigraphy recorded in 1974 within the powder magazine excavation does not conform perfectly with that previously recorded for other areas within Fort Michilimackinac (Maxwell and Binford 1961; Brown n.d.). Uppermost, a large thick deposit of late mixed fill overlies the magazine itself. It appears immediately below a shallow (3 to 5 inches) layer of brown humic sands, the latter in turn below the present sod. A conspicuous absence of appreciable

subsurface windblown dune sand and Late Occupation Zone immediately below, both found over much of the rest of the site, also was noted for the first time. The appearance of undisturbed structural remains so near the present surface is yet another first for Michilimackinac.

Several factors confused the stratigraphy revealed in 1974. They are as follows: remnants of a modern cinder roadbed pass through units 275R120 and 275R130; a wide range of variation in the thickness of strata; a high degree of lensing; a limited depth in the vertical excavation of some squares. Complete excavation of units adjacent to the magazine basement and entranceway may clarify the stratigraphy.

The following chart lists 1974 stratigraphic finds overlying the powder magazine with stratigraphy reported by Maxwell and Binford (1961) and by Brown (n.d.), and is adopted from Brown (n.d.: 29). That found in 1974 is listed for purposes of comparison:

1959	1967-69	1974
1. Sod Layer	Present	Present
2. Windblown Sand and Humus	Present	Present
3. Black Sand and Humus	Present (Late Occupation Zone)	Present "
4. Clay Apron	Present	Present
5. Parade Gravel	Present	Undetermined
6. Sand and Gravel Fill	Not Present	Not Present
7. Old Humus	Not Present	Not Present
8. Rotten Limestone	Not Present	Not Present
9. Brown Sand	Present Humic Sands	Present "
10. Charcoal Layers	Present	Undetermined
11. Sterile Sand	Present	Present
12. Base Gravel	Present	Present

The clearest stratigraphic sequence to emerge in 1974 occurs within the magazine basement itself (Figure 5). Four interior vertical profiles show superimposed brown humic sand, black sandy loam, limestone and large rock, and dark grey to black sandy loam, extending in that order from the sod above to the floor below. A layer conspicuous for its black and organically rich sandy loam, immediately below that of brown humic sand, contains a mixed assemblage of 18th through 20th century artifacts, with modern items predominating. Included are varieties of bottle glass representing different methods of manufacture and closure, pressed glass, art glass, late 19th century porcelain and ironstone, and others as yet unidentified. Cut animal bone and items usually associated with both eating and the storage of food suggest that the large circular depression caused by the collapse and disintegration of the magazine served as a dump for picnickers at Michilimackinac during the 19th and 20th centuries.

The layer of black sandy loam may correspond to one of "unconsolidated grey to black over-burden," reported by Stone (n.d.: 9) in the area of the Priest's House (see 1974 : 320-21; Figures 11, 199, 203, and 207), although its regular pattern of deposition within the magazine suggests a more careful placement, presumably to fill the depression over both the magazine interior and the entranceway. In other words, during the 19th and 20th centuries the depression may have been purposefully filled-in. The layer of limestone and large rock also appears to be the result of recent and purposeful back-filling, if one can judge by the small numbers of modern artifacts associated with its middle and lower levels. It is, however, a relatively sterile layer. Nevertheless, throughout the layer large metamorphic rocks are interspersed with the limestone, some of the former having small quantities of clay adhering to them. Because the clay may be vestigal mortar, the possibility that the specimens were used in the building of either the magazine or another fort structure is suggested. Similar metamorphic rock was found in a wall-like

arrangement near the present ground surface, resting on brown humic sand (in 285R110). Further, a single metamorphic stone was recovered from the magazine floor in 285R120, though no clay mortar was evident on this or any of the stones. All remain in situ.

Given the stratigraphic position of the wall-like arrangement (in 285R110) in relation to the west basement wall subsequently found for the powder magazine, it is possible that the rock is a remnant of a low stone wall which at one time bordered the vaulted roof of the magazine. Perhaps it acted as a buttress to retain the turf. Near the bottom of the same layer brick and mortar fragments appeared, though not in appreciable numbers. Presumably the brick and mortar have nothing to do with the metamorphic stone above.

Immediately below is a layer of dark grey to black loam, interpreted as the "Late Occupation Zone" by Brown (n.d.: 30-31). The break between the "Late Occupation Zone" and the rock layer above is not absolute, particularly in places where the rock layer is barely present or disappears altogether. Here the loam deposit above the rock layer rests upon that immediately below it, often making it impossible to determine at what point the "Late Occupation Zone" begins. Separation was all the more difficult because color differentiation between the two layers of loam has been obscured by leaching of organic materials from above. All the same, artifacts within the "Late Occupation Zone" are characteristic of "Late Occupation Zone" types (n.d.). Moreover, for the first time burned wood fragments of various sizes appeared and extended downward to the magazine floor. Several large fragments of wood, including some from Feature 548, the surviving wood floor of the powder magazine, are interpreted as the collapsed and deteriorated remains of the powder magazine. No doubt most of the wood above the floor is from the superstructure.

Structural Evidence

Structural remains of two buildings were identified in the 1974 season.

They include most of the powder magazine and entranceway, and what is presumed to be interior portions of an adjacent residence (Figure 6). The latter will be referred to as the "W structure." Evidence for the W structure consists of a series of intersecting clay-capped wall trenches (designated as Features 541, 542, 543, and 547) and a portion of a clay hearth apron (i.e., F546) within 275R100 and 285R100. The presence of both French and British artifacts within the structure indicate that it was a house. Artifacts, including those normally used in a kitchen and those used as personal effects, further support this suggestion. Because only a part of the W structure was uncovered, however, more excavation is needed to ascertain its function absolutely. All the same, descriptive information on the Lotbinière plan indicates that the W structure may be the southeast corner of a row house, perhaps that of one Chevalier (?). The same may be suggested indirectly in a letter from DePeyster to Gage, dated May 5, 1775.

Feature 539 (hereafter F539) was completely excavated and is interpreted as a shallow wood frame or box-like construction of undetermined cultural affiliation. It consisted primarily of wood fragments, more or less oriented in box-like fashion, and contained pigeon bones, eight fragments of brass, four seed beads, a silver clasp, a reworked spall, and a complete Gouda pipe bowl somewhat different from the type from Michilimackinac (i.e., Type C1, Sc, T3 of Stone's classification - see 1974 : 150). Perhaps when a greater area surrounding F539 is excavated, its function and relationship to other structures and features will be made clear.

Structural components identified for the powder magazine include its basement and entrance walls, the basement floor, and some of the superstructure (Figure 7). Construction details inferred from remains include a basement wall or revetment (?), the basement floor, a roof support, and some information on fabrication materials. Because the building burned,

and because it subsequently was kept wet by water seepage from the "Late Occupation Zone" and below, all wood is in a remarkable state of preservation. Particular care was exercised in not exposing surfaces to direct sunlight because of the resulting cellular collapse and destruction due to drying. Periodic watering and immediate covering of exposed surfaces of the wood with wet burlap bags proved an effective means against moisture loss.

Evidence for both the basement and entranceway consists of 38 charred upright posts ranging in diameter from 6 to 8 inches and spaced at intervals of approximately 6 to 8 inches within a footing ditch. These walls form right angles where the entranceway gives way to the magazine interior (in NE¼ and NW¼ of 295R120), but are less well defined where the south and east walls of the basement converge (NW¼ 295R130). The north wall has yet to be found, but is presumed to lie within the 275 base line balk between the R120 and R130 stakes. The northwest and northeast basement corners are therefore thought to exist within the balk, both slightly to the west and east of the 275 base line. Logically, the southwest corner of the basement should occur in the unexcavated NE¼ of 295R110.

No direct evidence exists for the splitting of posts (hewn?) used as a basement revetment in the powder magazine, although thin, charred wood fragments interspersed within the magazine itself, particularly near the east basement wall ditch in 285R130, may be survivals of a revetment. An interval between uprights as great as 6 to 8 inches requires that something hold back the earth of the basement foundation. The degree to which the slope of the foundation extends to the perimeter of the building wall further suggests the need for some kind of revetment.

Posts of both the west and east walls survived on the average of .73 feet above the magazine floor. The floor averages 6.18 feet below datum. The basement wall, both actual and extrapolated, indicates that dimensions

of the magazine are about 14 feet by 18 feet, remarkably close to those on the Lotbinière plan. Nothing is known of the elevation of the building, however.

In those squares completely excavated, the floor was found to be virtually intact; it consists of hewn (?) planks approximately 2 inches thick, 8 inches wide, and 5 or more feet in length. The floor clearly rests against ground-sills, seen along the west and east basement wall line. Subfloor surfaces found in 285R120 indicate that the floor boards rest directly upon a matrix of sand and gravel. Apparent lack of joists and/or clay aprons may be more apparent than real, however. Probably more excavation will reveal one or both of them. Artifacts recovered from the floor (in 285R110, 285R120, and 285R130) include the following:

nails
animal bones
2 fragments of "Jackfield" earthenware (CA, G4, TD)
2 fragments of English white saltglaze stoneware (CB, G1, TA)
3 pieces of tin-glaze earthenware (CA, G1, TA)
1 piece of polychrome export porcelain (CC, G1, TB)
3 pipe stems
1 gunflint fragment (SA)
28 pieces of window glass
1 fragment of white opaque glass
1 fragment of the edge of a mirror
1 portion of a base of glass stemware
1 unidentifiable glass fragment
2 pieces of green bottle glass
4 seed beads (C1, SA, T1)
1 necklace bead (C1, SC, T7, Vd)
3 fragments of sheet brass
1 brass chain with a cotter pin
3 fragments of tin
6 fragments of iron bands
1 unidentified iron fragment
1 awl fragment

Probably most of this material is English and is presumed to be late British occupational debris. The same is true for a smaller sample of similar artifacts recovered from the magazine entranceway and the interior proper (in 295R120 and NW¼ 295R130). Artifacts from the deepest level of the "Late

Occupation Zone" include:

nails
animal bones
4 fragments of window glass
3 pieces of green bottle glass
1 English bale seal (SA)
5 fragments of sheet brass
2 fragments of tin

Because neither 295R120 nor NW¼ 295R130 were excavated completely, no portion of the floor was exposed. The magazine entranceway is probably a ramp with accompanying wall construction leading to the basement of the powder magazine. The entranceway is approximately 3 feet in width and at least 7 feet in length; it probably begins in 305R120.

As mentioned earlier, evidence for the superstructure of the powder magazine consists of large wood fragments scattered throughout the "Late Occupation Zone" above the floor. Also included as evidence is a conspicuous post hole within the center of the magazine floor (in 285R120), a hole 8 inches in diameter. It extends .93 feet beneath the magazine floor, and was anchored in base sand and gravel 7.11 feet below datum. Presumably, the post supported a major cross-beam of the roof. Given that a revetment-type wall probably existed within the basement of the powder magazine, and that a vaulted roof covered with earth existed over the basement, the suggestion that the post was a major structural support for the vaulting above is reasonable. In fact, a similar roof is reported for the 1736 British powder magazine at Fort Frederica (Manucy 1962 : 51-53). Thus large fragments of wood found above the floor of the magazine (in 285R120) at Michilimackinac are interpreted as collapsed roof beams.

Five samples of wood were taken from the magazine entranceway and interior proper (from 285R120, 285R130, and 295R120). An additional sample was recovered from F539 (in 285R100). Identification has not yet been determined, however. Nevertheless, it is suspected that basement and entranceway uprights are of

cedar.

Summary

Excavations during the 1974 field season within Fort Michilimackinac concentrated on a large circular depression near the southeast bastion. The configuration had long been suspected as the ruin of the powder magazine, but no systematic excavations have ever been carried out within it.

By off-setting the grid system five feet, it was hoped that any surviving walls of the magazine would not be covered by balks, the latter left as a record of the overlying stratigraphy. It is clear that the uppermost levels of the depression were used in the 19th and 20th centuries as a dump. Overlying the actual floor of the magazine, but immediately below the 19th and 20th century fill, is a deposit of late British occupation, probably dating to the period immediately before the building of Fort Mackinac and the abandonment of Michilimackinac.

A recently discovered French plan of Michilimackinac, more so than the well-known later British plans of the site, shows a powder magazine outline almost co-terminous with the remains actually found. This may suggest that the architectural ruins of the powder magazine are French. Specifically, the 1974 field work revealed a building of upright log constructions. It measures about 14 feet by 18 feet in plan.

Also found on the south as an integral part of the powder magazine is the entranceway, conceived and constructed more or less as an extension of the walls of the magazine itself. The floor of the powder magazine is apparently of either parallel planks or boards, possibly fastened (nailed ?) to underlying wood joists. Walls of the magazine, because they contained spaces between the uprights of 6 to 8 inches, were almost certainly reveted against collapse from the slope of the foundation. Thin fragmentary wood as well as knowledge that

this type of architecture exists elsewhere at this time further support this suggestion.

The superstructure built over the foundation and basement of the magazine was apparently a vaulted construction of wood. Historic documents indicate that the roof was covered with sod and earth, doubtless a precaution against the danger of explosion. Large fragmentary wood samples probably are all that survives of the collapse of the overhead vaulting. A large post, located in what is thought to be the center of the magazine, which no doubt bears the overhead weight of the building, also supports this hypothesis.

At the end of the 1974 field season all structural remains were covered with burlap, plastic, and earth for protection against the elements. Deeper units were covered with boards as an additional safeguard, and other portions of the site were lined with plastic and partially backfilled.

Recommendations

Field work in 1975 will once again be planned and sponsored by the Mackinac Island State Park Commission in cooperation with the Museum, Michigan State University. Plans call for a resumption of excavations upon the powder magazine at Fort Michilimackinac, work which almost certainly will clarify the finds and suppositions of the 1974 field season.

More specifically, the location of the north and southwest basement walls and the complete excavation of the magazine entranceway will be primary objectives. Excavations below the magazine floor also are planned to determine the nature of its construction and what constitutes the subfloor building surface. Finally, the 1975 field work should insofar as possible determine the nature of relationships between the magazine and other structural features within the southeast bastion area. These include the "W structure" remains and at least one French period stockade.

BIBLIOGRAPHY

BARTHOLOMEW, HENRY S., editor

1908 "The Haldimand Papers," Michigan Pioneer Collections, second edition, Vol. X, Lansing, Michigan.

BROWN, JAMES A.

n.d. "Final Report of the Excavations at Fort Michilimackinac, Emmet County, Michigan, Conducted by the Department of Anthropology and Museum, Michigan State University 1967, 1968, 1969," ms., Museum, Michigan State University, East Lansing, April, 1973.

LOTBINIÈRE, MICHEL CHARTIER DE

1749 Relation très abregé de Mon Voiage de michilimackinac, Marie Gérin-Lajoie, translator, ms., Mackinac Island State Park Commission, Lansing, November, 1974.

MANUCY, ALBERT C.

1962 "The Fort at Frederica," Notes in Anthropology, Vol. 5, Department of Anthropology, Florida State University, Tallahasse.

MAXWELL, MOREAU S.

n.d. "Excavations at Fort Michilimackinac, 1959 Season: Preliminary Report," ms., Museum, Michigan State University, East Lansing, 1959.

MAXWELL, MOREAU S., AND LEWIS R. BINFORD

1961 Excavation at Fort Michilimackinac, Mackinaw City, Michigan: 1959 Season, Michigan State University Museum Cultural Series, Vol. 1, No. 1, East Lansing.

STONE, LYLE M.

n.d. "Excavations at Fort Michilimackinac, 1966 Season: Preliminary Report," ms., Museum, Michigan State University, East Lansing, 1966.

1974 Fort Michilimackinac 1715-1781: An Archaeological Perspective on the Revolutionary Frontier, Publications of the Museum, Michigan State University, Anthropological Series, East Lansing.

LIST OF FIGURES

*See inside back cover for Figures 6, 7, and 8.

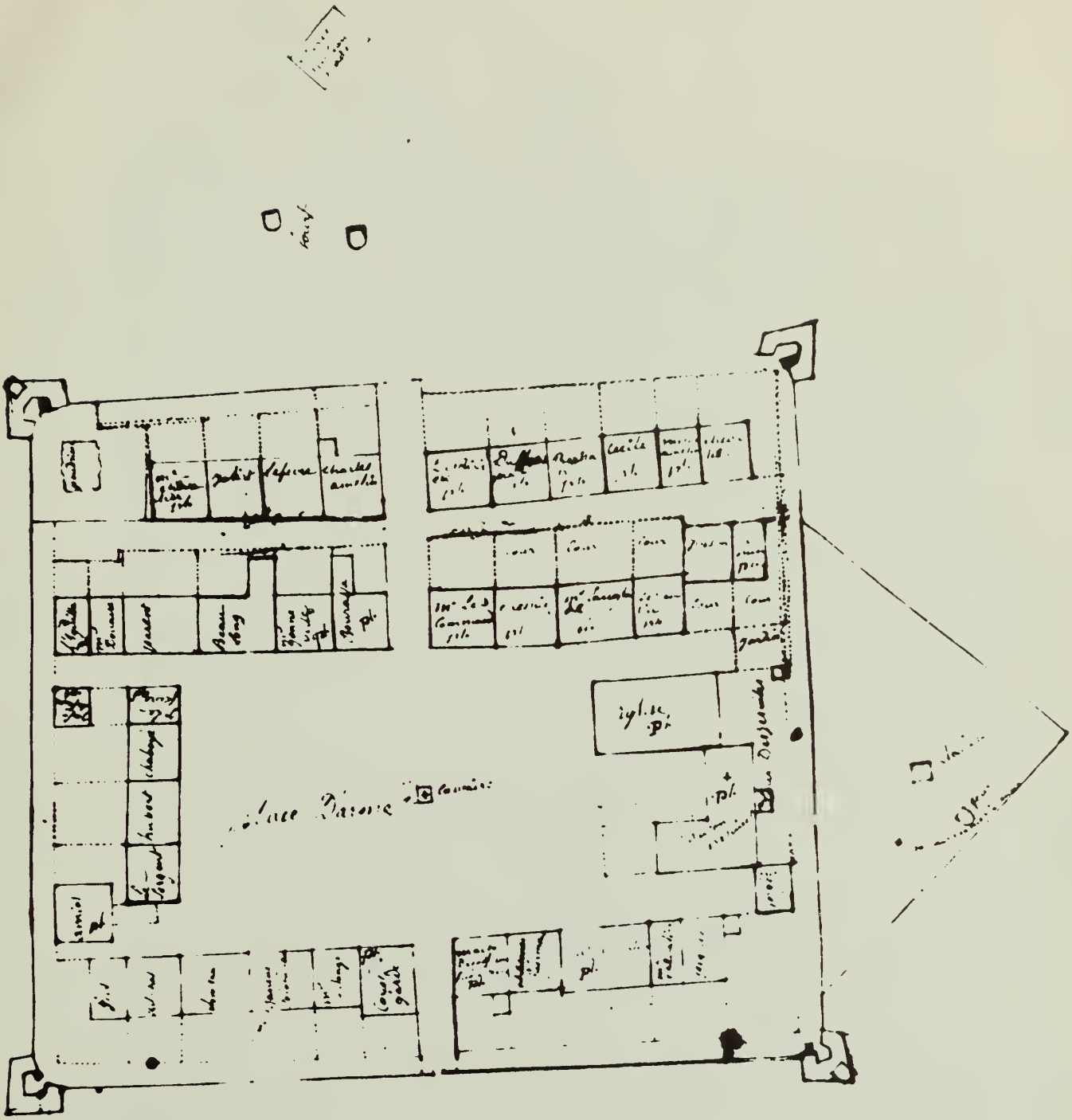

Figure 1. Lotbinière Plan, Circa 1749

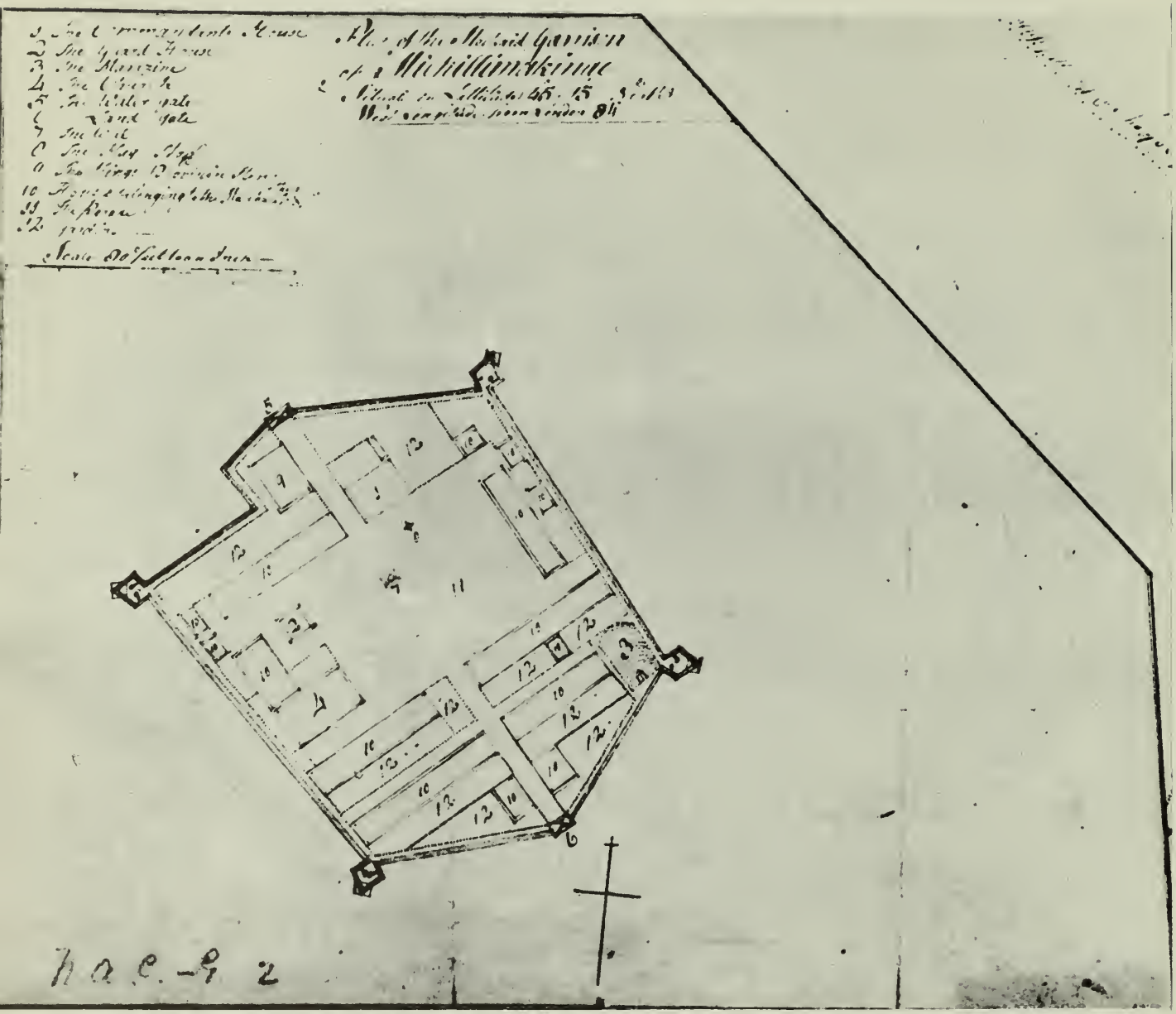

Figure 2. Anonymous (Crown Collection) Pian, 1765

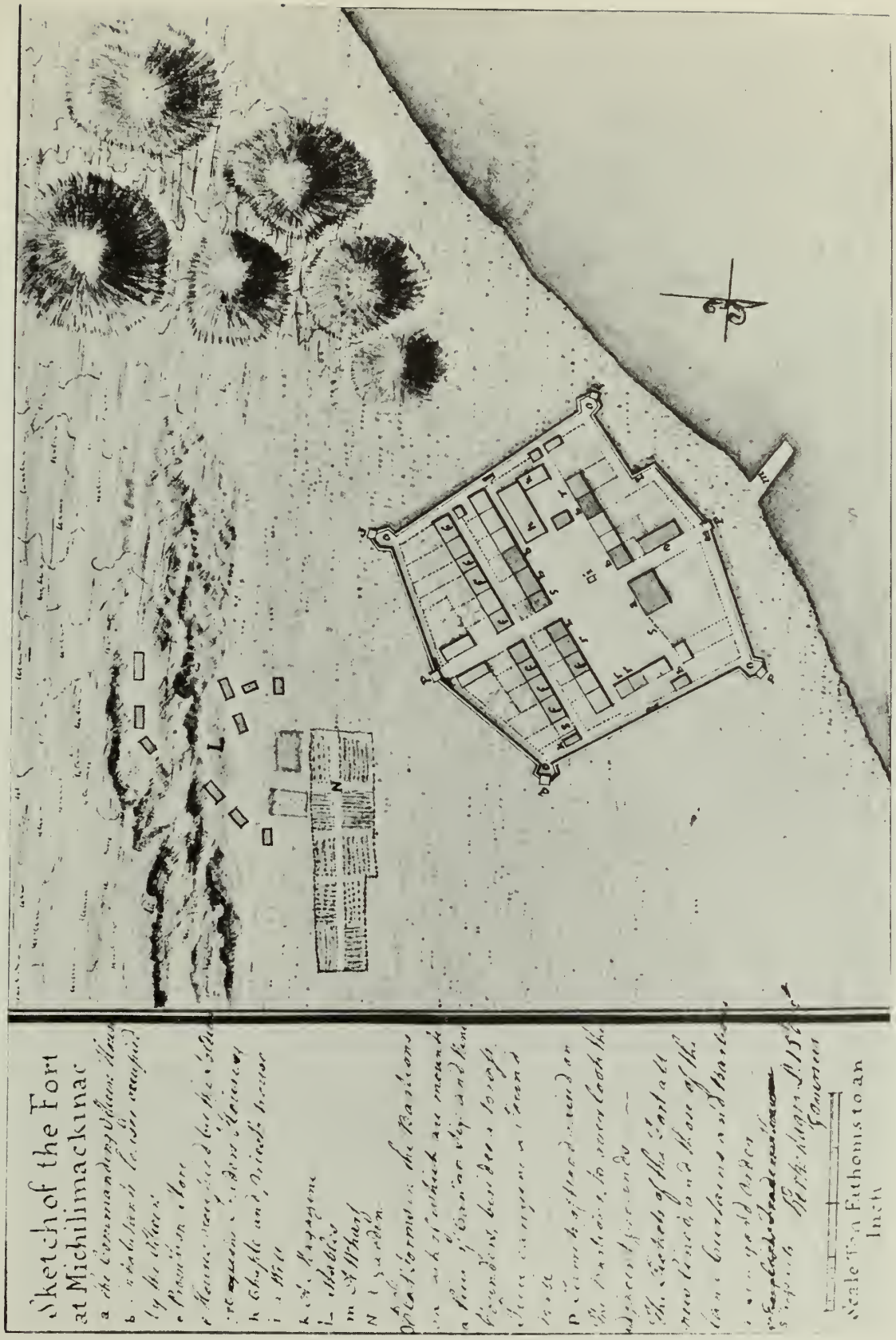

Figure 3. Magra Plan, 1766

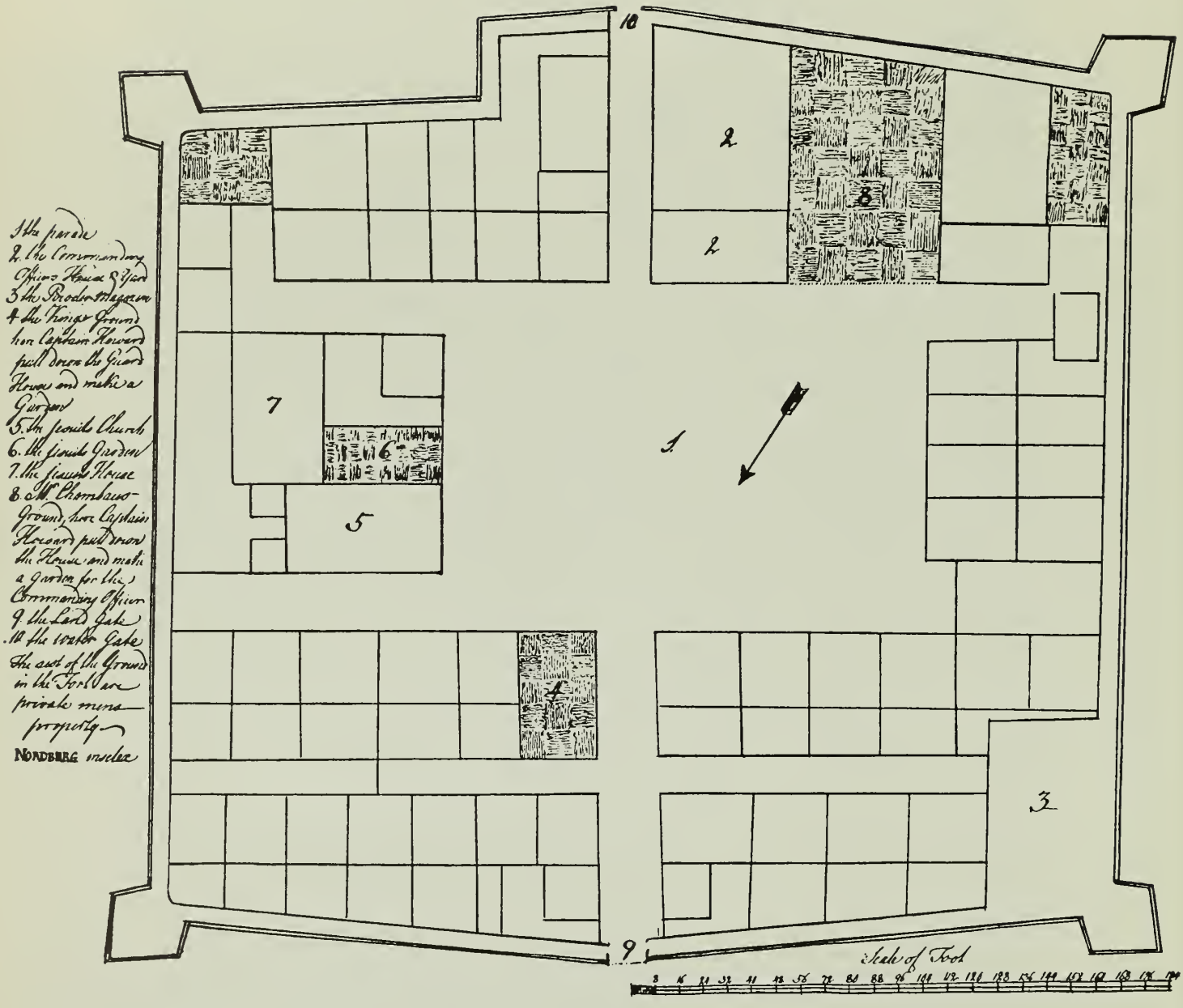

Figure 4. Nordberg Plan, 1769

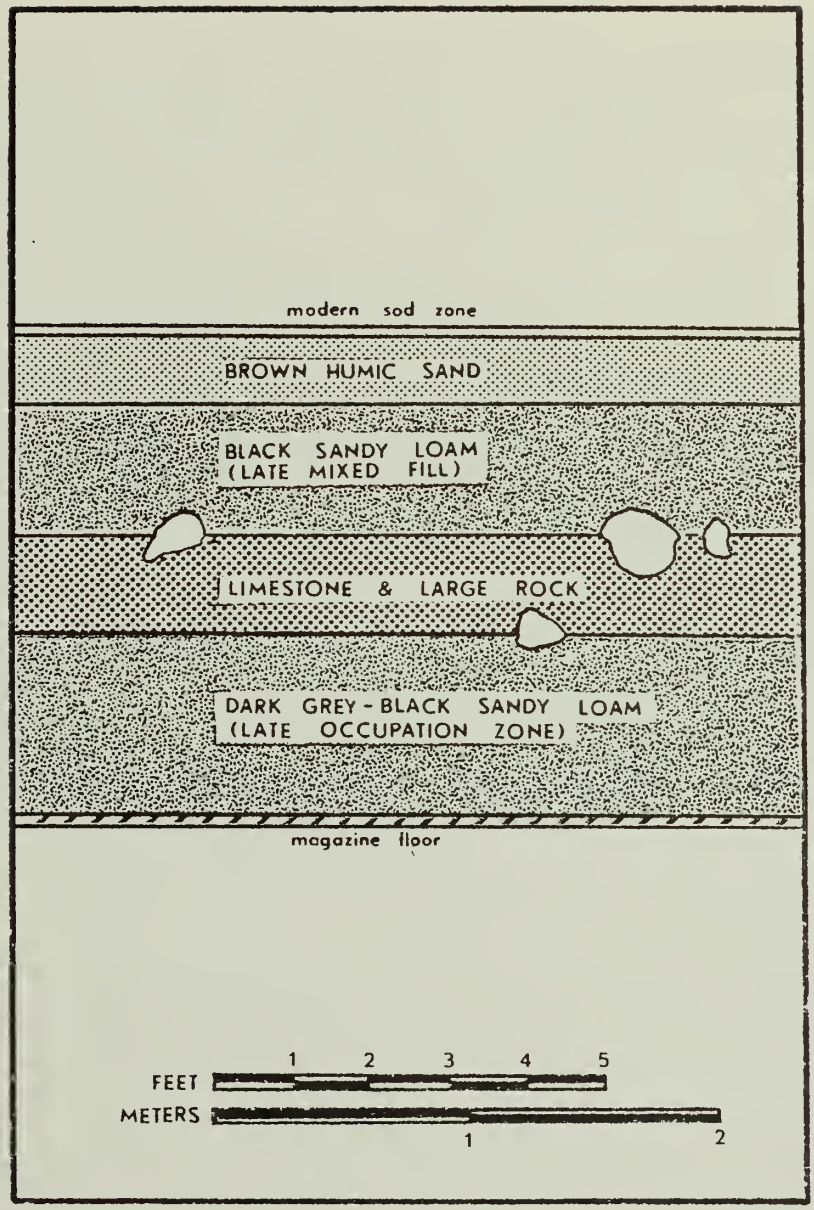

Figure 5. Idealized Magazine Stratigraphic Profile

Figure 9. Aerial View of Fort Michilimackinac

Figure 10. Powder Magazine Excavation in Progress

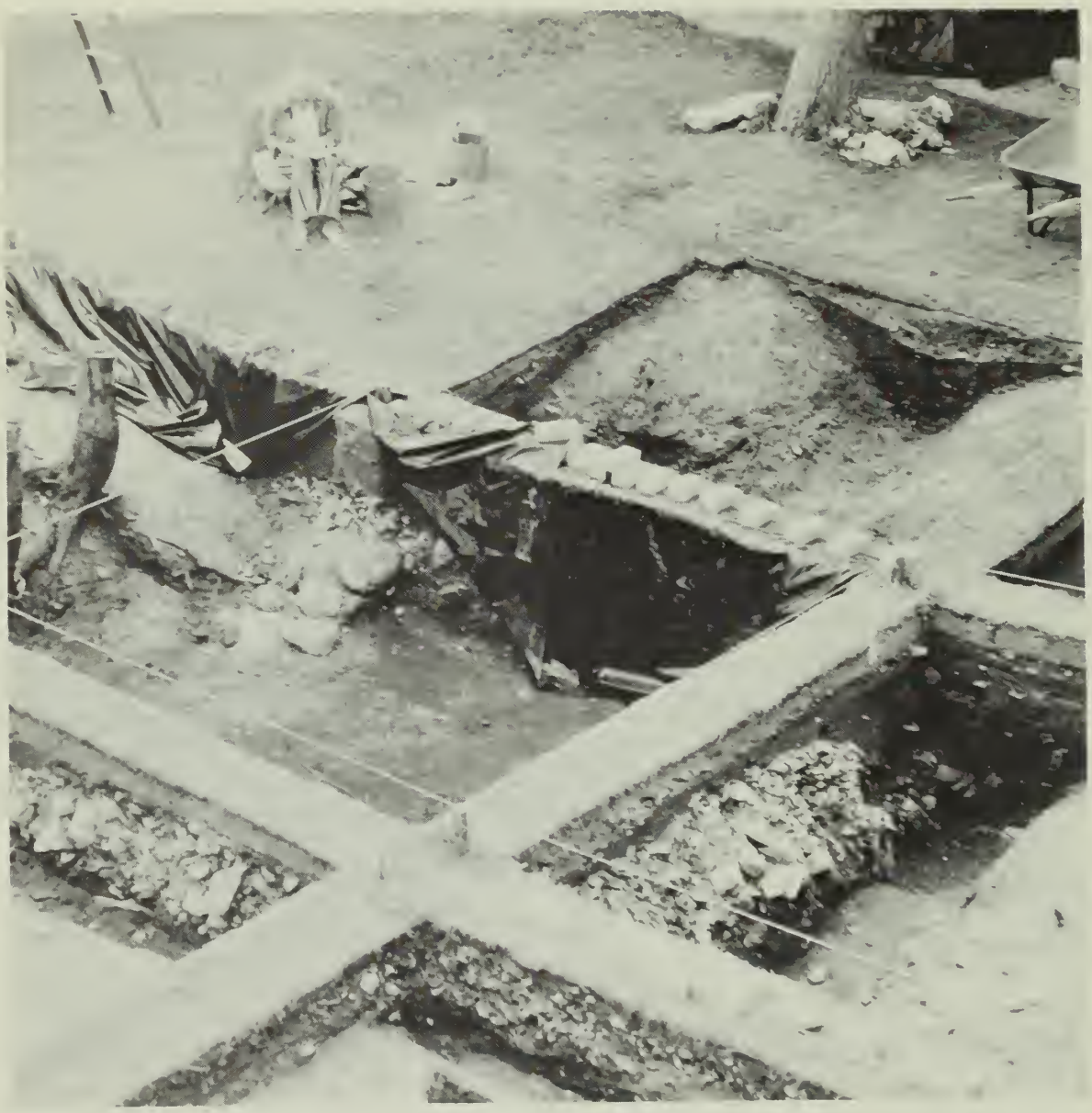

Figure 11. Powder Magazine Excavation in Progress

EXCAVATIONS AT FORT MICHILIMACKINAC, 1975:

THE POWDER MAGAZINE (GRANT NUMBER 26-74-00092)

by

Donald P. Heldman

and

William L. Minnerly

Abstract

Historic documentation and evidence from the first field season of archaeology are used to determine what of the powder magazine survives. Historic records suggest that the building was of wood, both at the time of French hegemony and during the later British occupation. Complete excavation of the building not only substantiates the historic documents, but also demonstrates that the British continued to use it after the French surrender in 1761. At the time of British abandonment of Fort Michilimackinac in 1781 the powder magazine purposefully was burned to the ground.

COMPLETION REPORT

a. Excavation of the Fort Michilimackinac Powder Magazine
Grant Number 26-74-00092

b. Total porject - $10,000 (1974); $10,000 (1975)
Federal share - 5,000 (1974); 5,000 (1975)

c. Federal funds expended - $10,000

d. Dr. Donald P. Heldman

e. Work accomplished: All of the Fort Michilimackinac, 1715-1781, Powder Magazine was excavated. The findings confirmed the structure indicated on four historic maps. Information is now available to make an authentic reconstruction. For further details, see enclosed report.

f. For maps and photographs, see enclosed report.

g. The Powder Magazine is a part of Fort Michilimackinac National Historic Landmark. This site has been under archaeological and historical investigation since 1959. Under the administration of the Mackinac Island State Park Commission the palisade and seven buildings within the fort have been reconstructed. An active interpretive program interprets the site to approximately 200,000 visitors each year. Admission fees from these visitors are used to reconstruct and maintain the historic properties.

TABLE OF CONTENTS

"It stands on a dry barren beach, the soft small sand surrounding it for some distance is intollerably troublesome, both for filling the shoes & blowing in the Eyes & crevices of houses & vessels &c."

John Porteous, fur trader, writing of Fort Michilimackinac on August 16, 1767 (Porteous Papers n. d.)

Introduction

For the seventeenth consecutive year the Mackinac Island State Park Commission in cooperation with the Museum, Michigan State University, carried out archaeological field work at Fort Michilimackinac, a frontier colonial outpost on the south shore of the Straits of Mackinac, Michigan. Under an Historical Preservation grant (number 26-74-0092) given by the Office of Archaeology and Historic Preservation, National Park Service, and administered by the Michigan History Division, Michigan Department of State, an all-out effort was made in a successful attempt to outline and completely uncover the powder magazine ruin of Michilimackinac.

Originally established as a small trading post about 1715 by the French, Fort Michilimackinac grew and prospered over the next half-century, even after it was surrendered to Great Britain in 1761 as a result of the French and Indian War. Although the exact year is unknown, an architectural expansion and rebuilding occurred sometime in the 1740's (Maxwell and Binford 1961: 32-45: Stone 1974 : 350-351: also see the map by Lotbinière in Gérin-Lajoie 1974), the

period when the powder magazine discussed in this report was surveyed, engineered, and built. As will be shown later, the powder magazine built by the French is the same as that illustrated and reported upon in later British correspondence. These historic documents along with field work in 1974 (Minnerly 1974) and 1975 lead one to conclude that the French magazine and that of the British are one and the same building. It is clear from the 1975 field work that the British utilized the French building, occasionally repairing or making minor alterations to it until the summer of 1781, at which time Michilimackinac was abandoned altogether. A greater understanding of the field work in 1975 will be gained through the use of the report covering the earlier work in 1974 (Minnerly 1974).

Between June 18 and September 18, 1975, six full-time crew members worked upon the site under the direction of Dr. Donald P. Heldman, Staff Archaeologist of the Mackinac Island State Park Commission. Additional help was forthcoming from members of the Michigan Archaeological Society, volunteers from the Museum of Michigan State University, and a number of interested individuals, particularly Dr. Earl Prahl of Flint, Michigan, Miss Sarah Bagshawe and Miss Victoria Barrow of Durham University in Great Britain, and men from the State Department of Corrections in Pellston, Michigan. Their help is gratefully acknowledged, for without it the field work would have remained incomplete at the close of the 1975 season.

Historic Documents

Historic records concerning the powder magazine at Michilimackinac are known for the most part from the Thomas Gage Papers in the Clements Library, University of Michigan, Ann Arbor, Michigan, and from the Haldimand Papers in the Michigan Pioneer and Historical Collections, Lansing (particularly Bartholomew 1908: Volumes IX and X). Four maps of the settlement, three British (see Stone 1974 : Figures 4-6) and one French, give approximate locations and dimensions of buildings both on the interior and on the outside of the fort. None of the maps agree with each other absolutely, although the French map, that drawn by Michel Chartier de Lotbinière in 1749 while making a survey of the water route from Quebec City to Michilimackinac (Gérin-Lajoie 1974 : 3), is in close agreement with the plan of the site thus far revealed by field archaeology (Stone 1974 : Figure 199).

Of the four maps of Michilimackinac, the earliest of the British plans, that dating to 1765 and presently in Collections of the Crown, Public Records Office, London, is of great interest because it shows a three-dimensional view of the powder magazine presumably drawn from first-hand observation (Figure 4). This unique illustration tempts one to interpret the drawing as "vaulted" architecture not unlike that of the Baroque period in Europe and, more to the point, like Vauban designs for powder magazines of stone (cf. Fort de Chartres, Illinois). In point of fact, however, the powder magazine depicted on the Crown map shows a mound of sod placed over the magazine, a configuration appearing deceptively like barrel-vaulting. This point will be examined in some detail later.

Both British and French documents refer to the semi-subterranean powder magazine found in 1975 (Gérin-Lajoie 1974 : 7: Gage Papers : supplementary accounts: Gage Papers : Campbell to Gage, letter of September 11, 1765: Gage Papers : Glazier to Gage, letter of July 2, 1768: Gage Papers : Turnbull to Gage, letter of July 31, 1770: Gage Papers : Turnbull to Gage, letters of May 12 and September 23, 1771: Gage Papers : Turnbull to Gage, letter of July 5, 1772: Bartholomew 1908 : 495, a letter from Sinclair to Gage dating to July 8, 1781).

British correspondence contains references for the need to repair the magazine, indications that the building was of wood like all buildings at Michilimackinac. In fact, because the fort was founded as a small trading post in the wilderness of the Upper Great Lakes region, it was never envisaged as a fort in the European sense of the word. Rather, it was conceived at best as a defense against the Indians. Moats and outer defenses, for example, all popular during the 18th century, the heyday of Vauban systems of defense, are totally missing at Michilimackinac. Furthermore, there is no nearby source of stone. Thus defenses and interior buildings including the powder magazine were of a transitory nature, a point made by Lotbinière in a journal dated 1749, when he stated that the "powder magazine is buried and covered with turf" (1974 : 6-8). Evidently the settlement was thought to be too isolated and hence safe from arenas of traditional European rivalry. With the outbreak of the American Revolution, however, this view became outdated, as did Michilimackinac itself, for eventually the British saw the defensive

vulnerability of the fort.

The British decided to dismantle and move the defenses and buildings of Michilimackinac over the water to the northeast to Mackinac Island, where a stone fort would be built. This measure, taken as a defense strategy against encroaching American rebels, is the final chapter in the history of Michilimackinac. Several letters from Patrick Sinclair, commandant of Michilimackinac in its waning days, tell of the dismantling of buildings and of their removal to Mackinac Island (Bartholomew 1908 : Vol. IX, 538-539 and 556; Vol. I : 495). Apparently a few buildings were demolished, including the powder magazine in the southeast corner of the fort (Bartholomew 1908 : Vol. X, 495). Field work demonstrates that "demolished" in the case of the powder magazine actually meant destruction by fire, for the powder magazine had been purposefully burned to the ground.

Thus the unique provincial architecture represented in the powder magazine is the result of a variety of factors: original French planning and building; subsequent British repair and rebuilding; limitations imposed by the natural environment of the Upper Great Lakes region in general, and the Straits of Mackinac in particular. Finally, in a recently translated account of land and property transfer during the final years of French hegemony at Michilimackinac, it appears that the powder magazine was privately owned. This factor may weigh heavily in any attempt to explain its unique architecture. According to Margaret Fortier, translator of a document dating to c. 1758 (Gage Papers : supplementary accounts), the Royal Notary at Michilimackinac recorded a transfer of land and real property from one Sieur La Grandeur to Sieur Louis

Lefebvre. The transfer included the following:

> "a house which belongs to him, seated and situated in this fort, with powder magazine also belonging to him, to Sieur Louis Lefebvre."

Further reading tells of the house and its location near the priest's house on the west side of the fort, and of the powder magazine:

> "and the said magazine seated and situated in the Bastion of the said fort on the east side; the said sale made for and by means of the sum of 3000 livres payable to the Illinois en bon de la guaise."

Private ownership could therefore account for its eccentric architectural character.

Field Procedures

After removing protective covering of boards, backfill, and sheet plastic, work began where the 1974 season had ended (Minnerly 1974 : 14). The research objective of the 1975 field season was to outline, completely excavate, and interpret the ruin of the powder magazine in the southeast corner of the reconstructed stockade. After several weeks of excavation it became clear that none of the overlying deposits had contextual relationships to the magazine, which is to say that all were deposited after abandonment of the building.

Excavation procedures and controls followed those used by earlier investigators at Michilimackinac (Minnerly 1974 : 4). Features were excavated and/or outlined as units sui generis; otherwise, arbitrary controls were employed. Features were numbered consecutively. Levels and their archaeological contents

were scrupulously kept within the ten feet grid system established for the site. Each level was determined by an absolute elevation taken by transit readings of one or more semi-permanent elevation markers which served as datums. All materials thus excavated were sifted through quarter-inch or one-eighth inch wire mesh screens, except in a few instances where finer screening was necessary. In those cases dirt was forced through window screen with water from a hose. Isolated lenses of culturally sterile soils within the overlying deposit or fill were sometimes removed without sifting.

Several significant departures from excavation procedures used in earlier field sessions at Michilimackinac include those which off-set the grid system five feet within the powder magazine, as well as complete removal of balks retained from 1974 along the 275 and 285 base lines and along the R130 axis (see Minnerly 1974 : 5: Figs. 6, 10, and 11). This made possible the complete disclosure of the magazine ruin itself, the result of which may be seen in Figure 5.

Stratigraphy

Stratigraphy observed in 1975 within the powder magazine did not differ substantially from that of the previous season (Minnerly 1974 : 5-8). Although strata overlying the ruin largely conform to those of the previous season, stratigraphy and its depositional history became clearer as excavation progressed and led to some modification in the earlier interpretation. New evidence in 1975 also led to some changes in descriptions of the stratigraphy over that used in the

earlier report, a discussion of which follows.

Excavation of the north wall of the magazine ruin (Figure 1) revealed the uppermost layer or "Black Sandy Loam" deposit, a later fill composed primarily of 19th and 20th century items. This layer follows perfectly the outline of the original foundation excavation of the magazine. In profile along the 255R100 base line (Figure 1), for example, the black sandy loam varied in depth from several inches to over four feet (over 1.2 meters), a circumstance which demonstrated that the entire layer post-dated abandonment of the building. That this was not recognized in 1974 is due to the fact that some colonial items were present within it; hence, it was felt that the deposit could have been contemporaneous with the powder magazine. Only by isolating disturbances resulting from illicit investigations in the magazine early in this century, vandalism that often penetrated the wood floor of the building, was it possible to demonstrate that colonial artifacts had been redeposited and mixed with the later fill above. Figure 1 shows the numerous disturbances and resulting destruction to the wood floor of the powder magazine.

The "Limestone and Large Rock stratum," within both the dark loam above and below it, was found to be an isolated lens overlying the southwestern corner of the magazine ruin, and was not a uniformly distributed deposit (Minnerly 1974 : 7). It is totally absent elsewhere within the building site. However, the 1975 excavation revealed for the first time a culturally sterile "Brown Sand and Rock" layer in the form of lenses redeposited either by nature or man after the abandonment and burning of the magazine. This sand and rock

layer originated in the surrounding Algoma Pleistocene beach, through which the powder magazine foundation was originally excavated: the beach is the source of the lenses. Lenses varied in thickness, probably because of sloughing and erosion from wind and water. Although for the most part culturally sterile, lenses did contain artifacts, items of refuse from adjacent houses (Figure 6). Most artifacts, therefore, regardless of age or cultural origin, post-date the abandonment of the powder magazine by the British.

Finally, the so-called "Late Occupation Zone," the deepest dark sandy loam layer (Minnerly 1974 : 8), extended northward and contracted perceptively over the north wall of the building along base line 265R in square 265R100. By following the dark sandy loam, excavators located the north wall of the magazine directly below the point where the layer began to contract. Horizontally, the "Late Occupation Zone" outlined the ruin below. It also contained British colonial as well as 20th century artifacts, lenses of wind-blown sand, and organic materials, all accumulations from the time Michilimackinac was abandoned (Figure 6). It is now clear that the phrase "Late Occupation Zone" does not apply to this deposit. Although correctly used elsewhere to describe the debris and corresponding level of British occupation at Michilimackinac, that which Brown (n. d. : 30-31) originally christened the "Late Occupation Zone," it is concluded that the two deposits are not contemporaneous. As will be seen later in this report, the British completely cleaned out the powder magazine before destroying it. Thus nothing could be the equivalent of the "Late Occupation Zone" found elsewhere.

Depositional history of the magazine thus consists of wind and water lain deposits, augmented by the erosion of colonial rubbish and midden, organic growth, and recent dumping from nearby Mackinaw City, Michigan. This stratified overburden began to form the day the magazine burned and collapsed and is, in summary, a composite of roof sod, carbonized wood, wind-blown and water-carried sand, and rubbish, both colonial and modern. No doubt the surrounding sand and beach gravels also crumbled and sloughed into the magazine depression (Figure 2). It is reasonable to assume that this process continued undisturbed until the later part of the nineteenth century.

Disturbance to the powder magazine stratigraphy began with the arrival of treasure-seekers late in the nineteenth century. Evidence of their activities may be seen in the rearranged and often altogether missing structural remains of the powder magazine itself. Large amorphous pits, no doubt the work of untrained excavators (Figure 1), pock the floor of the magazine. Each is characterized splintered and scattered fragments of charred wood mixed with Algoma beach. Far more numerous were smaller circular pits uppermost in the stratigraphy. These too eventually were recognized as the work of vandals.

Modern dumping included the large rock and limestone concentrations, first thought in 1974 to perhaps have structural relationships with the magazine. The uppermost black sandy loam, in many instances lying above 20th century fill, almost certainly dates to the first quarter of this century. Two interviews with Mr. Reynolds Schneider, a lifelong resident at Michilimackinac, corroborated that the magazine depression had been used by local residents of Mackinaw City

for dumping. Indeed, the cinder roadbed (Feature 550) discovered during the 1975 field work to pass over the building site was recalled by him as the road used in the 1920's to place rubbish in the depression.

Since 1959, the year the site of Michilimackinac underwent the first of the extensive reconstructions that characterize it, sod has been grown within the parade ground of the fort. This growth, and that which occurred naturally since abandonment of the site in 1781, accounts for the humic quality of the stratigraphy.

Finally, methods of recording stratigraphy differed somewhat from those of the previous season. The names of various layers of the deposit are herein simplified through the use of level numbers. Obviously the reason for the change is the recognition that the deposit above the ruin post-dates it, and thus had nothing to do with the colonial occupation at Michilimackinac. Hence the sod and brown humic sand zone of 1974 (Minnerly 1974 : 6-7) appears as "Level 1" in the field records for 1975: Black Sandy Loam of 1974 is "Level 2"; Brown Sand and Rock equals "Level 3"; "The Late Occupation Zone" or "L. O. Z." equates with "Level 4"; the exposed powder magazine ruin itself is "Level 5." All the same, both descriptive terminology and accompanying level number are frequently used synonymously in the field records and in the following report. Figures 2 and 3 show the overlying stratigraphy of the powder magazine in squares 265R100 and 295R120.

The Powder Magazine Ruin

With removal of rubbish and fill over the magazine, a building entirely of wood and bark shingles was disclosed. An area of 30 feet (9.1 meters) square was excavated within the existing grid system in the extreme southeast corner of the reconstructed fort in a successful attempt to completely outline the building (Figure 5). Specifically, the squares excavated are as follows: 265R110-130; 275R110-130; 285R110-130; 295R110-130; 305R120. The powder magazine itself measures 22 feet by 33 feet in plan (Figure 1). In depth it varies from five to five and one-half feet (1.63 to 1.8 meters) below the surrounding beach and thus for all practical purposes is subterranean. The original foundation excavation apparently was dug through culturally sterile sand and beach gravels sometime in the 1740's or possibly earlier when Michilimackinac was expanded.

In both construction technique and architectural style the powder magazine appears, at first glance, to be French, a poteaux en terre building set into an undisturbed footing ditch (Figures 1, 2, 5, 7, 8, 9, and 14). Because most of the footing ditch has never been disturbed, and because the sloping side wall of the foundation excavation shows no indication whatsoever of architectural remains, it is certain that the powder magazine found in 1974 and 1975 is the only one ever constructed there. One architectural feature almost certainly French is an exterior wall cover of wattle, a construction of woven bark and brush at 5.8 feet (1.75 meters) below datum (in square 275R130, level 5) (Figure 7). Wattle has been found elsewhere at

Michilimackinac (Maxwell and Binford 1961 : 65, 80, and 83) and in every case is identified as French. Furthermore, although a test excavation of the footing ditch in 260R120, level 5, produced few artifacts (Figure 8), those recovered are French.

This footing ditch, recorded as Feature 551 in the field notes, is in cross-section about two and one-half feet (61 to 76 centimeters) in width at the level of the wood floor which it surrounds. It narrows to about nine inches (23 centimeters) at its bottom, and therefore slopes inward in cross-section. Upright wall posts rest against the vertical inner side of the footing ditch. It is two and one-half feet deep (about 75 centimeters). Most of the fill composing the ditch is of sand and beach gravels, although some evidence of humus, probably from rotting posts, and a few French artifacts (one spall gun flint, a fragment of light blue case bottle glass, and a fragment of window pane) are present. Dimensions of the footing ditch, as well as its contents, are similar to those of poteaux en terre buildings at Michilimackinac (Maxwell and Binford 1961 : Figures 8, 12, and 13) and other French colonial sites in the eastern United States (Brown 1974 : 160; Heldman 1973 and 1975; Judy D. Tordoff : personal communication concerning excavations at Fort Ouiatenon, a French colonial outpost on the Miami River in Indiana; Traité de Massé n. d. ; also see architectural plans and French buildings themselves in Peterson 1949 and 1965, and in Wilson 1965 and 1969). Except at the southeast and the southwest corners of the powder magazine (Figure 1), the footing ditch appears never to have been disturbed, as one would expect if the walls had been repaired or replaced.

According to R. C. Koeppen, Center for Wood Anatomy Research, Forest Products Laboratory, U. S. Department of Agriculture, in Madison, Wisconsin (personal communications, June 4, September 5, and October 7, 1975), wall posts, wall beams, floor boards, and clapboards are of eastern white pine (Pinus strobus), and roof beams and corner posts are of northern white cedar (Thuja occidentalis). Figure 9 shows charred and fragmentary posts set upright one next to the other in the south wall (in square 295R120, level 5). The surface of logs facing the magazine interior is charred black. This suggests that the magazine burned from within, probably the method employed by the British when moving the fort to Mackinac Island. There can be little doubt that the well-preserved south wall, with posts as close to one another as possible, is the construction technique used in walls throughout the building. Wall posts vary in diameter from six to eight inches (15.2 to 20.3 centimeters). Corner posts, those which carried most of the overhead weight of the building and the mound of sod which covered it, vary in diameter from eight to twelve inches (20.3 to 30.5 centimeters) (Figures 10-13). Large corner posts are typical of French poteaux en terre colonial architecture because the roof rested directly upon crossbeams or ties on top of the corner posts (for example, see Peterson 1949 : Figs. 6-7; Franzwa 1967 : 98-153, particularly photographs of 18th century houses in Ste. Genevieve, Missouri; Porterfield 1969 : 151 and Figs. 1A, 1C, and 2A-C; and others).

In the case of the powder magazine at Michilimackinac, corner posts apparently were inadequate support for the combined weight of the walls, roof,

and mound of sod. To remedy this deficiency, the building possessed, in addition to the corner posts, at least two internal supports along the central axis of the magazine floor (Figure 1).

Upright wall posts composed the superstructure to which clapboards (merrains) or planks and bark shingles were nailed. The fire that swept the building in 1781 obliterated most of the uprights, ties, the roof, and whatever additional architectural embellishments composed it. Nevertheless, enough fragmentary evidence survives to demonstrate the manner in which the building was conceived and erected, and of equal importance, of what materials the building consisted.

Within squares 275R130 and 285R110 (see Figure 1), large fragmentary pieces of charred clapboards survive, obviously one of the basic building materials of the structure (Figures 14 and 15). The example adjacent to and originally a part of the east wall (see Figure 1) shows that clapboards were nailed to the outside wall because the specimen still rests upon a wall section that collapsed and burned on the floor of the magazine (Figures 1 and 14). The clapboard measures about nine to ten inches (22.9 to 25.4 centimeters) in width. It is not a complete specimen, but about nine and one-half feet (2.85 meters) of the original length survive. Although its original height above the wattle cover at the base of the wall is unknown, it must approximate 18 inches (45.7 centimeters), the present distance from the north end of the clapboard to wall posts on the east (Figure 1). Presumably boards covered the roof of the magazine in the same manner, but little evidence of this survives.

Peterson (1949 : 20-21) states the use of clapboards by the French is a late introduction to New France, probably originating with the British to the east. Clapboards used in the powder magazine could be either French or British in origin, however.

Northern white cedar shingles (Thuja occidentalis, according to R. C. Koeppen : personal correspondence, September 5, 1975) were in turn nailed to the outside of the clapboards. To judge by their placement along the south wall where, like wall posts mentioned earlier, the condition of preservation is excellent, shingles are placed edge to edge (Figure 16). Long strips of shingles surviving on both the north and south walls are up to two feet (61 centimeters) in length. One strip extended well into the footing ditch in 260R120, as evidenced by a clearly visible organic stain. Shingles served the same function as their modern counterparts.

One enigmatic aspect of wall construction of the magazine is the use of wattle cover along the lower extremity of at least one wall (in 275R130, level 5). As mentioned earlier, wattle-and-daub construction, that is, bark and brush woven to hold daub or clay (bouzillage) much as modern lath holds plaster, is clearly a French technique. British architecture at Michilimackinac employs sophisticated lath and plaster (Maxwell and Binford 1961 : 61-62). Examples may be seen today on Mackinac Island at Fort Mackinac, where original British buildings preserve contemporary lath and plaster. (Recent restorations of the Officers' Stone Quarters, for example, a British building dating to the 1780's, disclosed wall construction.) Therefore the wattle cover

on the powder magazine is French. No daub was found with the powder magazine, however. Because of the superb conditions of preservation there can be little doubt of this (Figure 7). One is thus led to conclude that only wattle was used in the construction of the powder magazine. A clue to its function may be related to the wood floor within the structure itself and is discussed below.

Figure 1 shows floor boards neatly placed next to one another and covering the entire interior surface of the powder magazine. Floor boards rest more or less five feet (1.5 meters) below the surrounding surface of the site. No joists underlie them, for disturbances, that is, pot holes (see Figures 1 and 5) from illicit digging early in the twentieth century (see Stone 1974 : Figure 7) were carefully excavated below edges of the surviving floor boards. Not a single vestige of a joist, not so much as a stain was found. Moreover, no nails are present in the floor, another indication that joists are missing altogether. It thus appears that floor boards rested directly upon sand and gravel of the Algoma beach. Generally in the construction of powder magazines the floor is separated from the underlying surface by a number of joists. Air then circulates freely within the building, providing ventilation. Otherwise, dangerous gas and a high percentage of humidity may build up. It is possible that humidity, more than any other factor, was the cause of frequent repair to the powder magazine.

Because floor boards at Michilimackinac rest directly upon the surface, a function of the wattle cover mentioned earlier may be suggested. Air could have passed through the loose woven bark and brush and thus ventilated the

building. Whether woven wattle extended the length of one or more of the walls, or only in certain areas, is a matter of speculation. No wattle is present along the north or south walls, where construction details are best preserved. Simple ventilating shafts could have reached the wattle through the sod cover above. All of this, it must be stressed, is speculation. It is equally plausible to suggest that the wattle cover is a vestigal French wall, eliminated by later British rebuilding.

Floor boards vary in width from nine to eleven inches (22.9 to 28 centimeters) and always are cut to the inch (Figures 1, 5, and 13). Because in colonial times as today the British system of measurement included the inch, the floor boards probably are British. They may be seen in plan in Figure 1. It therefore seems reasonable to assume that the British added floor boards, and perhaps the clapboards of the walls and roof as well, in the normal course of repair. One avenue of library research that could clarify these points is a translation of French documents pertaining to the Upper Great Lakes region in general, and Fort Michilimackinac in particular.

A close examination of the facade or south wall of the ruin reveals the best preserved portion of the magazine. In the middle of the wall is a door, complete with two hewn jambs and a hewn threshold. Although charred and somewhat distorted, the jambs measure approximately six inches (15.2 centimeters) square. The width of the doorway is 32 inches (81.3 centimeters). The threshold could not be measured precisely because it is covered by wreckage from the roof (Figure 1).

The map of Michilimackinac in the Crown collection, London, depicts two doors, an overhead lintel probably of hewn timber, and what clearly is an arch above the lintel. It seems certain that the doorway found during the 1975 field work is that illustrated in the Crown map (Figure 4). Moreover, a rotted and fragmentary panel of wood, possibly one of the actual doors illustrated in the drawing, was found lying in the entranceway in square 300R120, level 2. It is unburned. Perhaps at the time of demolition of the powder magazine the doors were freed from the doorway before the building was set ablaze.

Not illustrated in the Crown map is an entranceway archaeologically discovered to extend southward for seven feet (2.1 meters) or more from the door. The entranceway is outlined by irregularly spaced puncheons (i. e., short, split uprights) that possibly supported some sort of makeshift overhead cover. On the other hand, they may be little more than remains of a revetment to hold back the beach. Architecturally the puncheons obviously were not part of the original powder magazine, but rather are a later addition. The fact that the entranceway is not shown in the detailed illustration in the Crown map (Figure 4) supports the idea that it post-dates 1765, the year the plan was drawn. The remaining maps, one French and two British plans mentioned earlier in this report and illustrated elsewhere (Minnerly 1974 : Figure 1; Stone 1974 : Figures 4 and 5), are horizontal drawings only and may be little more than sketches done for different reasons (see Fortier 1974 : 29). None shows the entranceway.

Excavation of fill and rubbish similar to that within the magazine

depression immediately to the north revealed the entranceway to be about four feet (1.2 meters) in width (Figures 1 and 3). Its height is unknown.

Unlike the entranceway, it is possible to estimate the original height of the powder magazine itself because the northwest corner post fell backward at the time the building burned. As a result, the post is preserved (Figure 21) more or less intact. In length it measures about five and one-half feet (1.65 meters). When added to the burned portion of the corner post still within the footing ditch, a height of about one foot (30.5 centimeters), the magazine was slightly more than six feet (1.8 meters) in height.

Although little of the upper portion of the walls and roof survived the conflagration of 1781, enough has been found to give a reasonable idea of its appearance. It is certain that the roof was not vaulted, the most common trait of French powder magazines of the day (Saucier and Seineke 1969 : Figure 3; Wilson 1971 : Figures 3 and 10; Traité de Massé n. d. : 58; and others). Furthermore, the "vaulted" illustration in the three-dimensional drawing on the Crown map (Figure 4) actually depicts a mound of sod and earth cover on the roof and long walls. It is clear, as a glance at Figures 1 and 18 shows, that the roof of the magazine was trabeated because the main central beam or tie which ran the length of the building collapsed to the floor more or less in its original position (squares 285R120 and 295R120, both at level 5). With it went cross-beams or rafters that had rested on both the central tie, as well as on those of the east and west walls. Thus a portion of the flat, ungabled, trabeated roof survives more or less intact near the front (south end)

of the building.

The position of the surviving beams and rafters is such that there is little doubt that the roof was flat, or that the entire building appeared as a huge rectangular box covered with bark shingles. Sod was placed over the roof and along only the east and west walls by 1765, for the Crown map illustrates the facade of the building. Lotbinière also noted that the "powder magazine is buried and covered with turf" (Gérin-Lajoie 1974 : 7) in 1749, the year he visited and described Michilimackinac for the French governor in Quebec, who wished an accurate survey of the water route between Quebec and Michilimackinac (Gérin-Lajoie : 2-3 and 8). Sod cover may have been a feature of the building throughout its history. At the time the British burned the magazine, it is possible that they removed some or all of the sod. Otherwise, more of the walls and roof would be preserved. Because of the charred and fragmentary nature of the roof, dimensions are meaningless, although remains of rafters and ties may be seen in Figure 1.

The last of the architectural features discovered in 1975 is a low, almost indistinguishable earthwork which surrounds the magazine on the west, north, and east sides (Figures 19 and 20). At present the earthwork is only approximately six centimeters high; it is about four feet (1.2 meters) in width at its widest point and is underlain, at least where archaeological testing has been done (in squares 265R130; 275R110; 275R130; 285R110), with a thick (about 10.1 centimeters) layer of pure beach sand. It too is about four feet (1.2 meters) in width and doubtless a man-made feature. Perhaps it is a French

survey marker of some kind, delineating the plot of ground within the fort set aside in the 1740's for the powder magazine. Although the earthwork as such does not appear on the Lotbinière map of 1749, the outline of the lot or property line of the powder magazine is there (see the Lotbinière map in Gérin Lajoie 1974), and is more or less coterminous with the earthwork discovered in 1975.

Finally, several steps were taken to preserve the ruin. First, numerous coatings of sodium chloride were applied with a brush to all exposed wood, both charred and unburned. This insures against damage by living organisms, such as fungus. Second, a commercial preservative recommended by Wood Products Corporation, Madison, Wisconsin, and consisting primarily of acidic cupric chromate was sprayed on the wood a number of times. This formed a protective coating over the wood which, when kept from the elements, will preserve it indefinitely.

Artifacts

The majority of artifacts recovered from both field seasons of 1974 and 1975 have no historic or functional associations with the powder magazine. Artifacts are therefore unimportant to the interpretation of the building. Indeed, the paucity of man-made items found upon the floor of the magazine indicates that the British took everything from it in their move to Mackinac Island. Only two specimens of lead buckshot, both from a space between two floor boards in 285R120, level 5, the few French artifacts mentioned earlier from the footing ditch in the north wall, and a few nails within the ruin, as

well as on the floor, were found. At this writing none have been analyzed.

Because the overwhelming majority of artifacts came from the deposit above the ruin, artifacts thought to have sloughed and eroded into the magazine depression after its abandonment, they may best be treated as rubbish from adjacent residences (see the Lotbinière map in Gérin-Lajoie 1974; Minnerly 1974 : 9 and Figures 2, 3, 4, and 7). The majority of artifacts, however, date to the nineteenth and twentieth centuries and, as has been mentioned, result from dumping of rubbish by residents of Mackinaw City. The unfortunate disturbances to the stratigraphy of this deposit by treasure-seekers may render the deposit useless for analysis. In any event, artifacts are not described and analyzed here because, for the most part, they have nothing to do with the powder magazine.

In the case of nails found on the floor, and therefore in direct association with the building itself, it eventually may be possible to separate French nails from those of the British. Perhaps this could be done through metallurgical analysis. Because many specimens are still in the wood and shingles where they originally were driven, metallurgical analysis might prove particularly valuable in determining what of the building is French and what is British. No such analysis has been undertaken, however.

Summary

The well-preserved ruin of the powder magazine at Fort Michilimackinac, Michigan, was completely excavated during the 1975 field season. Its salient

characteristics include traits of both French and British architectural style. The French built the magazine sometime in the 1740's, and the British repaired and probably rebuilt parts of it after 1761. The result is a unique combination of both French and British vernacular architectural traditions.

French traits include the poteaux en terre architectural style and various other minor traits, such as wattle cover on the walls and uprights forming the walls proper. A vestigial earthwork surrounding the powder magazine probably also is French.

Building techniques that may be either French or British include the use of clapboard or plank sideboards, cedar bark shingles, and a flat, ungabled roof. The fact that the building is subterranean also could be of either tradition.

Exclusive British traits consist of the floor boards resting directly upon the natural surface of the beach and a curious entranceway of upright puncheons that possibly served as overhead cover to the door of the building or as a revetment to hold back the sloughing beach.

BIBLIOGRAPHY

BARTHOLOMEW, HENRY S., editor

1908 "The Haldimand Papers," Michigan Pioneer and Historical Collections, second edition, Volumes IX and X, Lansing, Michigan.

BROWN, IAN W.,

1974 "Archaeological Investigations at the Historic Portland and St. Pierre Sites in the Lower Yazoo Basin, Mississippi," Unpublished MA thesis, Department of Anthropology, Brown University, Providence, Rhode Island.

BROWN, JAMES A.,

n. d. "Final Report of the Excavations at Fort Michilimackinac, Emmet County, Michigan, Conducted by the Department of Anthropology and Museum, Michigan State University : 1967, 1968, 1969," manuscript on file at the Museum, Michigan State University, East Lansing, Michigan.

FORTIER, MARGARET

1974 "The Development of the Fortifications at Louisbourg," Canada, edited by David P. Gagan, Vol. 1, No. 4, Holt, Rinehart, and Winston of Canada, Ltd., Toronto.

FRANZWA, GREGORY M.

1967 The Story of Old Ste. Genevieve, Patrice Press, St. Louis, Missouri.

GAGE PAPERS, CLEMENTS LIBRARY, ANN ARBOR, MICHIGAN

1762-76 Papers of General Thomas Gage relating to his command in North America, 1762-76, 137 Volumes.

n. d. Supplementary Accounts, Volume 138.

GERIN-LAJOIE, MARIE, translator

1974 "Relation trés abrége de Mon Voiage de michilimackinac," by Michel Chartier de Lotbinière, original manuscript in the Library of the New York Historical Society, mimeographed paper on file with the Mackinac Island State Park Commission, Lansing, Michigan.

HELDMAN, DONALD P.

1973 "Archaeological Investigations of Fort Toulouse : 1972-73," mimeographed paper, University of Alabama in Birmingham and the Office of Archaeology and Historic Preservation, United States Department of the Interior, National Park Service, Washington, D. C.

1975 "Archaeological Investigations of Fort Toulouse : 1973-74," Alabama Historical Commission and the Office of Archaeology and Historic Preservation, United States Department of Interior, National Park Service, Washington, D. C. (in press).

MAXWELL, MOREAU S. and LEWIS R. BINFORD

1961 Excavation at Fort Michilimackinac, Mackinaw City, Michigan: 1959 Season, Michigan State University Museum Cultural Series, Vol. 1, No. 1, East Lansing, Michigan.

MINNERLY, W. L.

1974 "Excavations at Fort Michilimackinac, 1974 Season: A Preliminary Report on Historical Preservation Grant Number 26-74-00092," manuscript on file with the Mackinac Island State Park Commission, Lansing, and with the Museum, Michigan State University, East Lansing, Michigan.

PETERSON, CHARLES E.

1949 Colonial Saint Louis: Building a Creole Capital, Missouri Historical Society, St. Louis, Missouri.

1965 "The Houses of French St. Louis," in The French in the Mississippi Valley, John Francis McDermott, editor, University of Illinois Press, Urbana, Illinois.

PORTEOUS, JOHN, PAPERS

n. d. John Porteous Papers, Burton Historical Collections, Detroit Public Library, Detroit, Michigan.

PORTERFIELD, NEIL H.

1969 "Ste. Genevieve, Missouri," in Frenchmen and French Ways in the Mississippi Valley, John Francis McDermott, editor, University of Illinois Press, Urbana, Chicago, London.

SAUCIER, WALTER J., and KATHRINE W. SEINEKE

1969 "Francois Saucier, Engineer of Fort de Chartres, Illinois," in Frenchmen and French Ways in the Mississippi Valley, John Francis McDermott, editor, University of Illinois Press, Urbana, Chicago, London.

STONE, LYLE M.

1974 Fort Michilimackinac 1715-1781: An Archaeological Perspective on the Revolutionary Frontier, Publications of the Museum, Michigan State University, Anthropological Series, East Lansing, in cooperation with Mackinac Island State Park Commission, Mackinac Island, Michigan.

TRAITÉ de MASSÉ

n. d. "Livre des Fortifications du Sieur Masse Ingenieur ordinaire du Roy quil a commence en 1687 et ouil a travaille a ses heures de relache en differentes reprises jusquen 1728," two volumes, manuscript, in fol 131 D, Bibliotheque del l'inspection du Genie, Paris.

WILSON, SAMUEL

1965 "Colonial Fortifications and Military Architecture in the Mississippi Valley," in The French in the Mississippi Valley, John Francis McDermott, editor, University of Illinois Press, Urbana, Illinois.

1969 "Igance Francois Broutin," in Frenchmen and French in the Mississippi Valley, John Francis McDermott, editor, University of Illinois Press, Urbana, Chicago, London.

1971 "Gulf Coast Architecture," in Spain and Her Rivals on the Gulf Coast, Ernest F. Dibble and Earle W. Newton, editors, The State of Florida, Department of State, Pensacola, Florida.

FIGURES 1-21

(Figures 1 and 2 are in the map pocket)

Figure 3. Cross-section of fill overlying the magazine ruin in square 295R120. Note the bottle dating to the turn of this century within the rock layer.

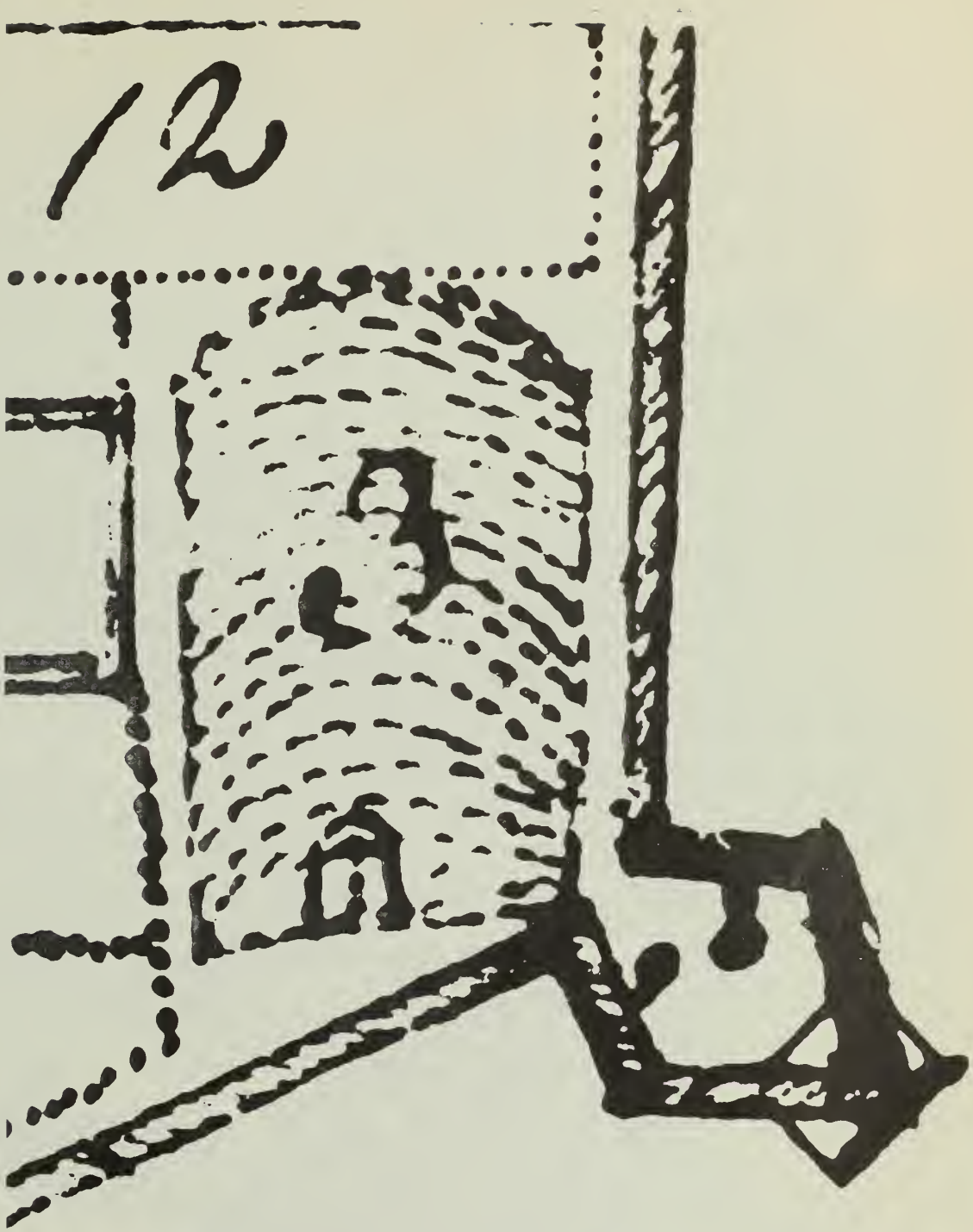

Figure 4. Three-dimensional drawing of the powder magazine in a map of Michilimackinac in the Collections of the Crown (from the original map in the British Public Record Office, C. O. 700/2. Crown copyright material, reproduced with permission).

Figure 5. View of the completed excavation from the northeast on the reconstructed catwalk along the palisade wall.

Figure 6. English smoking pipe within the deposit overlying the central beam or roof tie of the powder magazine (in 295R120). The artifact eroded into the depression of the magazine after its destruction and abandonment.

Figure 7. East wall of the powder magazine in square 295R130 showing wattle along the outside wall. View is from the southeast.

Figure 8. North wall of the powder magazine in 265R120, showing the archaeological test of the footing ditch. View is from the north.

Figure 9. South wall of the powder magazine showing a detail of upright logs charred on the interior surface (in square 295R120). Note also the charred floor boards in the foreground.

Figure 10. The northwest corner of the powder magazine (in 265R110). Note the undisturbed footing ditch paralleling the corner.

Figure 11. The northeast corner of the powder magazine (in 265R130).

Figure 12. The southeast corner of the powder magazine (in 295R130).

Figure 13. The southwest corner of the powder magazine (in 295R110).

Figure 14. Collapsed and burned east wall in 275R130. View is from the north. Note the large clapboard surviving on the wreckage of the east wall.

Figure 15. Detail of fragmentary clapboard in square 295R110.
View is from the west.

Figure 16. Cedar bark shingles in situ along the outside of the south wall of the powder magazine in squares 295R120 and 295R130. Note the floor boards in the upper left and the east wall on the right.

Figure 17. Detail of floor boards in square 295R110.

Figure 18. Detail of collapsed roof in squares 285R120 and 295R120. Note that beams are ungabled. View is from the south.

Figure 19. Sand layer under the low earthwork surrounding the powder magazine (in 27SR110, level 1). View is from the southeast.

Figure 20. Sand layer under the low earthwork surrounding the powder magazine (in 275R130, level 1). View is from the west.

Figure 21. Toppled and fragmentary portion of the northeast corner post in 260R130, level 3 (within beach slough).